# CHAPTER 7.
# DRAINAGE AND EROSION PROBLEM ANALYSIS

Drainage and erosion problems were identified by interviewing staff from King County and other agencies, reviewing recorded drainage complaints, and assessing hydrologic modeling results. No detailed investigation of the existing drainage system or survey of cross-sections was included in this study.

## 7.1 APPROACH TO IDENTIFYING DRAINAGE PROBLEMS

Drainage and erosion problems were identified as follows:

- The basin steward and other King County DNR staff identified problem areas based on their knowledge.
- Seventeen drainage complaints were reviewed and field-investigated as needed.
- King County Road Maintenance staff identified problem areas based on their knowledge.
- Other agencies (City of Enumclaw, Weyerhaeuser, Washington State Department of Transportation (WSDOT), Puyallup Indian Tribe, Pierce County, and the Washington State Department of Fish and Wildlife) identified problem areas based on their knowledge.
- King County's existing CIP was reviewed for currently scheduled projects.

Following the compilation of known drainage and erosion problems, two field reconnaissance trips were made to validate the problems and consider possible solutions. The HSPF hydrology model was used to help estimate flows at some of the problem areas. Because the upper basin is designated forest reserve and is private property, no investigation was conducted above the Weyerhaeuser Mill.

## 7.2 IDENTIFYING THE EXISTING DRAINAGE NETWORK

The drainage network map for the City of Enumclaw was reviewed and discussed with City staff for hydrology modeling and flood problem identification. No existing drainage network map was available for unincorporated King County, but many of the existing culverts were investigated during field reconnaissance. The drainage basin boundary map for the King County Drainage District #6 was also reviewed. This map shows the area of the District's responsibility and the drainage channels that the District maintains.

Much of the drainage system for unincorporated King County consists of open channels and bridges. There are sections of these channels and some bridges that have less than a 25-year level of flood protection. Actual capacities and the limits of the overbank flooding could not be determined without cross-section surveys and flow-line data.

## 7.3 LIST OF POTENTIAL DRAINAGE AND EROSION PROBLEMS

Seventeen drainage complaints from the Boise Creek Basin were reviewed, and recommendations to address them were prepared, as shown in Table 7-1.

TABLE 7-1.
DRAINAGE COMPLAINTS IN BOISE CREEK BASIN

| Complaint Number | Address | Problem | Recommended Actions |
|---|---|---|---|
| 1991-0458 | 46618 244th Ave SE | Flooding: Poor drainage from road ditch | Road maintenance |
| 1993-0405 | Mud Mountain Dam Road | Dumping: Referred to DDES[a] grading | Enforcement |
| 1993-0698 | 29025 SE 477th Street | Drainage: Information request | Referred to Health Department |
| 1995-0566 | 24521 SE Mud Mountain Road | Drainage: Possible obstruction of road drainage | Road maintenance |
| 1996-0648 | 47304 284th Ave SE | Washout of retaining wall and driveway culvert | Completed |
| 1996-0999 | 24531 SE Mud Mountain Road | Flooding | Road drainage upgrade resolved problem. Completed |
| 1996-1123 | SE 464th and Semansky | Flooding: Boise Creek floodplain drainage issue | City installed second culvert across SE 456th Street to reduce flood problem |
| 1996-1485 | 46213 244th Ave SE | Ditch: Property impact roadside ditch drainage | Road maintenance |
| 1997-1162 | 46905 283rd Ave SE | Ditch: Maintenance required | Drainage District #6 responsibility |
| 1998-0364 | SE 462nd St and 287th Ave SE | Drainage: Grading in wetland buffer | Enforcement |
| 1999-0853 | 46922 283rd Ave SE | Water Quality: Sediment discharge from active pit site | Reviewed and no problem found |
| 2000-0031 | 46310 290th Ave SE | Drainage: Sheet flow across private road from private easement | Private problem |
| 2000-0624 | 46605 284th Ave SE | Drainage District Maintenance | Drainage District #6 responsibility |

a. DDES = Department of Development and Environmental Services

TABLE 7-1 (continued).
DRAINAGE COMPLAINTS IN BOISE CREEK BASIN

| Complaint Number | Address | Problem | Recommended Actions |
|---|---|---|---|
| 2000-0688 | 31002 Enumclaw/ Chinook Pass Road | Water Quality | Culvert across Highway 410 is partially plugged with sediment and impacts downstream channel. WSDOT maintenance responsibility |
| 01E – Enumclaw Golf Course | 45220 288th Enumclaw, WA | Riparian degradation in significant chinook spawning area | Coordination with course contractor and the City of Enumclaw. Revegetation; LWD placement; Establish monitoring site for phosphorus and temperature |
| 15E – Drainage Improvement | North of 47527 288th Ave SE | Failing culverts | Replace 36" corrugated metal pipe (CMP) with concrete box culvert to improve fish passage and increase pipe capacity. |
| 1996-0636 | 46925 248th Way SE Enumclaw, WA | Eroded Boise Creek stream bank | Stabilize stream bank with vegetation and LWD. |

Most of the complaints were eliminated from further consideration for the following reasons:

- The problem only affected one person and no one else was contributing to the problem.
- The problem is the responsibility of another agency.
- The problem has already been corrected.
- Enforcement action is pending.

Recommendations for improvement projects have been developed for the remaining complaints as well as for several drainage or erosion problems identified by various agency staff members or by review of the County's CIP. These projects were submitted to the County with a preliminary priority ranking of high, medium, and low as shown in Table 7-2. The only project ranked as a high priority is the culvert replacement at 288th Avenue SE that the County's Roads Maintenance Division completed in 2003.

## 7.4 CONCLUSIONS AND RECOMMENDATIONS

The Boise Creek Basin is largely undeveloped except for Subbasins 1 and 2. Most of the drainage system in unincorporated King County consists of open channel and road culverts. The drainage system in the City of Enumclaw is a combination of open channel and pipe systems. The Boise Creek channel from RM 0.8 to RM 4.5 is subject to overbank flooding during major storm events (approximately a 25-year event). Most of this floodplain is agricultural land or is on the Enumclaw Golf Course, and no homes are flooded. Several

homes used to be flooded near RM 1.2, but the City constructed a new culvert across SE Semanski Street to address this problem.

Stream flows are not expected to increase significantly in the future, but stream erosion and channel capacity problems are expected to worsen unless actions are taken to reduce existing problems. Seven improvement projects to address drainage and erosion have been identified. Some of these projects address multiple problems, such as flooding, erosion, and fish passage. In addition to these projects, development practices adjacent to the stream need to be changed and buffer strips secured adjacent to the stream banks.